

# THE MANAGEMENT OF ROAD PROJECTS IN PAPUA NEW GUINEA

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## ABSTRACT

This paper presents the Papua New Guinea (PNG) National Roads Authority (NRA) approach to project management and the financing of road projects and maintenance. The NRA is using performance based contract models to deliver 567 km of routine maintenance for four different contracts over a 3-year period. The performance based contracts are financed from the Road Fund accumulation from road user charges.

Two major projects are currently being undertaken through the Public Private Partnership (PPP) arrangement: the construction and management of a heavy vehicle weighbridge and 40 km of dual-carriageway highway. The Build Maintain Transfer (BMT) model is being undertaken in the Highlands region under a multi-tranche financing facility financed by the Asian Development Bank (ADB) and the PNG Government. The NRA is responsible for the design of the projects, which are being financed by the NRA through the road fund. The private sector is responsible for the construction, operation and management of the asset for the duration of the contract (6 years).

## 1.0 INTRODUCTION

The PNG road network comprises 9,000 km of national roads and 21,000 km of lightly-trafficked roads. These roads are very important because they create access for 85% of the population who live in remote areas of the country. These road networks are an extremely valuable public asset. The average Gross Domestic Product (GDP) of PNG is US\$1200 million per year, and the asset value of the national roads alone is estimated to be US\$2 billion. Both the Government and the roads administrations are expected to invest maintenance funding in a way that returns maximum benefit to road users and the communities which they serve.

The road network is managed by the Department of Works with direct funding from the Government of PNG.

### 1.1 Past experiences in road financing and management

In the mid-1990s, the delivery of general road maintenance activities was the responsibility of the Department of Works using Plant Transport Board (PTB) road works equipment and Provincial Civil Section crews (flying squad teams) using guaranteed funding from consolidated revenue. Other private sector equipment required on a needs basis was engaged through annual PTB three minor contract arrangements.

Under the Government's 1995 Policy, road maintenance activities were outsourced in an attempt to develop and encourage local entrepreneurs. This has contributed to a large extent to a lack of basic routine maintenance on public roads in PNG. This policy, and the inconsistency in the provision of required funding, has contributed to a reduction in road maintenance activities because contractors cannot be engaged without payment for the services rendered and the high mobilization costs associated with projects in rural areas.

Whilst the contractors continue to participate in road maintenance activities, funding from the main donors has been the main incentive in attracting them. However, the issue is still "sustainability" in the supply of funding to motivate the local contractors and consultants to actively participate in transport projects. Most contractors are involved in rehabilitation and periodic maintenance activities generally have the perception that routine maintenance activities are not worth investing in unless the Government adopts a sustainable and management model to ensure that "sections of roads that have been improved are transferred for routine maintenance". [4]

## **2.0 PNG NATIONAL ROADS AUTHORITY**

The National Roads Authority (NRA) was established by Act 2003 by the Government of PNG. Its role is to manage the National Road network. Prior to the establishment of the NRA, the road network was traditionally managed through the Department of Works free to the public, while water and power were subjected to user pay fees. [2]

The NRA's mission is: "To strive consistently towards maintaining the National road network in a condition which satisfies user's needs, and to manage the country's road assets efficiently on behalf of the government and people of PNG". [2]

The objectives of the NRA are to:

- a) raise funds for the maintenance of public roads
- b) ensure the efficient preparation of effective annual road maintenance programmes
- c) ensure that all routine, specific and emergency maintenance of roads and road rehabilitation and reconstruction funded by the authority are executed in a transparent, effective and efficient manner, in order to optimise the contribution of road assets to the economic and social development of Papua New Guinea. [2]

The functions of the NRA relating to project management and financing are to:

- a) establish and operate a road fund from road user charges, budget and other sources
- b) maintain and manage asset condition data using the Road Asset Management System (RAMS) and the Bridge Management System (BMS)
- c) formulate and determine prioritised annual road maintenance plans and programmes using RAMS and BMS, supported by the road sector cost recovery revenue
- d) determine and implement road user charges in accordance with the financial resource requirements of the annual road maintenance plans
- e) deliver the required routine, specific and emergency road maintenance in accordance with the maintenance service levels established for each class or type of road, through the contracting of independent contractors, and monitor and supervise the contracts as they are executed
- f) ensure that all contracts are tendered through a transparent and competitive procedure to economic efficiency and sustainability in the delivery of road maintenance and rehabilitation
- g) report publicly and transparently on the collection of user charges, revenue, and the use of the revenue on the road maintenance programmes in accordance with internationally accepted accounting principles. [2]

### **2.1 NRA Management Structure**

The daily management of the authority is managed by the Chief Executive Officer (CEO) who reports to the NRA Board. The CEO is supported by three Unit Managers who are responsible for the management of the road fund, project planning and programming, and implementation. The Board is managed by a Secretariat. The NRA Board appoints the CEO, Secretariat and the three Unit Managers. All the other staff are recruited by the CEO in accordance with public service regulations. There are currently 17 staff, with 14 more to be recruited in 2010. [1]

To maintain transparency, efficiency and effectiveness, the appointment of the NRA Board is normally carried out in accordance in the Authority Act. Most members of the Board are recruited from the main road user group organisations: 70% of the Board members come from the private sector, whilst the remaining 30% are heads from the Departments of Treasury, Planning, Transport and Works, the Departments responsible for the transport infrastructure. [1]

### **2.2 NRA and DOW operational relationship**

Prior to the establishment of the National Roads Authority (NRA), the Department of Works (DOW) was the main implementing agency responsible for the management, construction and maintenance of the National and provincial roads network. . The DOW has offices in 19 provinces of the country and continues to actively construct and maintain roads and bridges under the traditional schedule of rates process. The projects are funded through consolidated revenue.

For the NRA to meet its obligations and perform its functions, the DOW and NRA needed to establish an operational relationship. The arrangement is such that the DOW continues its statutory role in road

construction whilst the NRA assumes responsibility for road maintenance management and financing. The operational relationship between DOW and NRA in the project management and financing of roads is shown in Figure 1.

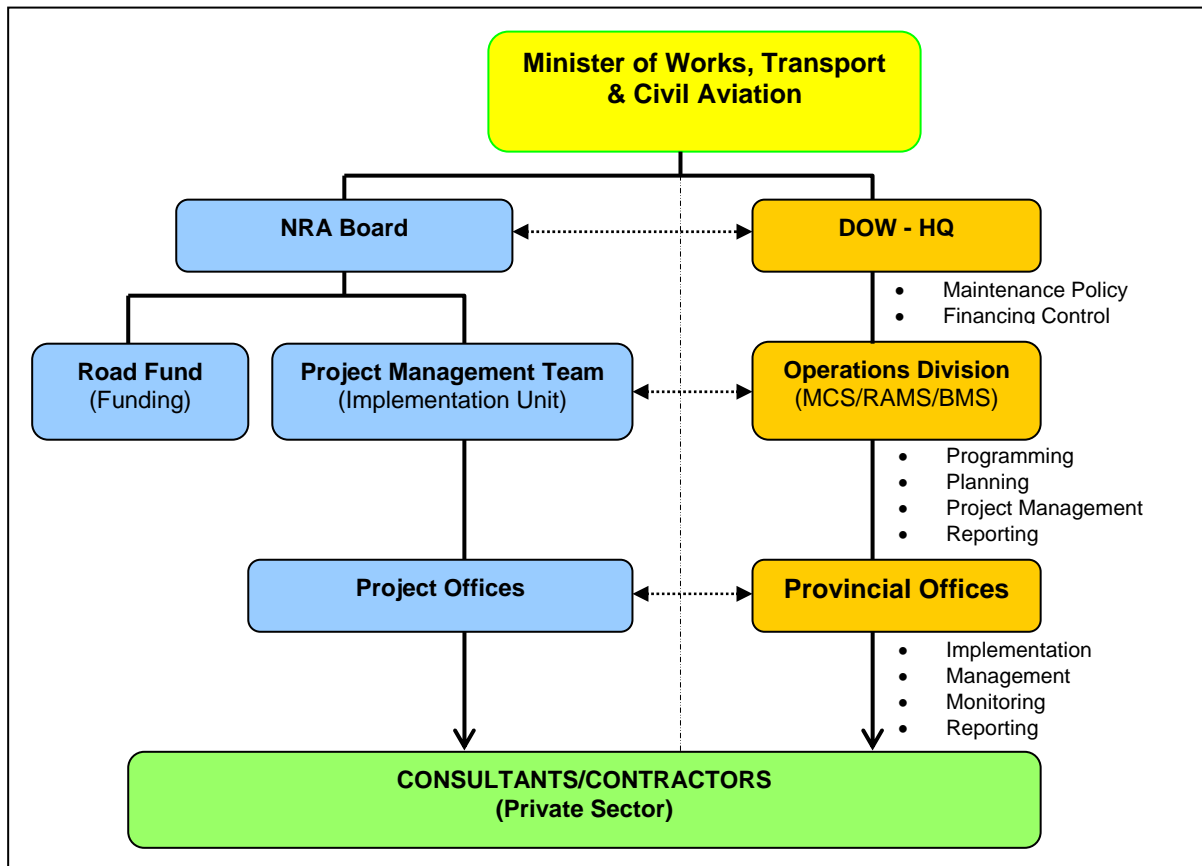


Figure 1. NRA and DOW operational relationship in project management and financing. [2]

Although the NRA Act was gazetted in July 2003, the Board was not established until 2004. The NRA had no staff until the CEO was appointed in 2007. The initial three-year term of the Board expired in 2007 and a new Board was appointed in May 2008. The NRA has now recruited key staff so it can commence to function. The capacity development within the NRA has been supported by the ADB through Technical Assistances (TA).

### 3.0 ROAD PROJECT FINANCING

The National Roads Authority road projects are financed through various revenue sources. The authority is empowered by the NRA Act 2003 to raise funds for the maintenance of public roads. The funds are raised from road user charges and infrastructural loans sourced from the ADB. The Government allocates the required maintenance funding through consolidated revenue.

#### 3.1 Road Fund

The revenue intended for the road maintenance is ultimately generated from road user charges. The NRA Act stipulates that the authority establish and operate a road fund obtained from road user charges which is used primarily to pay for the contracting of road maintenance services. The sources of road user charges include:

- Road use charge (RUC), including a US\$0.02 levy or surcharge on gasoline and diesel fuel.
- Road damage charge (RDC), which is a heavy vehicle charge based on the laden axle weight of vehicles. It is intended to cover the costs attributed to different vehicle depending on their size and gross vehicle weight, viz. US\$660 (4-10.0 tonne), US\$990 (11-18 tonne) and US\$1320 (>18 tonne) annually
- Vehicle Registration, a flat increase in the annual vehicle registration fee, applicable to all vehicles. This revenue is yet to be directed into the road fund.

The main purposes of the road fund are to:

- a) secure a more reliable and sustainable level of funding for road maintenance than has previously been available from government budgetary allocations
- b) protect funds raised from road user charges against raids (unplanned expenditures) and annual variations on planned programmes
- c) establish a close fee-for-service link between the charges paid by users and the road maintenance service received by users
- d) provide a lever to secure more efficient, cost-effective and customer-responsive road sector management
- e) allow users to have a greater say in how road maintenance funds are managed
- f) ensure the effective availability of funds for road project financing and payment.

### **3.2 NRA financial management system (FMS)**

The Road Fund is supported by the NRA financial management system (FMS) financed by the ADB under a Technical Assistance (TA). The FMS effects and increases transparency and accountability within the NRA. It supports the Road Fund Unit in achieving timely and rigorous reconciliations, the orderly keeping of records, strict adherence to financial management policies and internal controls, and an orderly and timely year-end process for the preparation and audit of annual project accounts.

### **3.3 PNG Road Asset and Bridge Management Systems (RAMS & BMS)**

The planning and programming of road and bridge maintenance and upgrading is carried out with the support of the Road Asset and Bridge Management Systems (RAMS and BMS). RAMS was first developed in 1999 through a Technical Assistance (TA) from ADB. BMS was developed in 2004 as a sub-project through a World Bank Road Maintenance and Rehabilitation Project. RAMS stores data related to 8,500 km of National roads and 19,000 km of provincial roads. Currently, bridge and culvert inventory data from 10 provinces are captured and stored within the BMS. Traffic and condition surveys are conducted on National roads annually to support the preparation of the annual project budget.

### **3.4 Other source of revenue**

The sources of funding, other than the road user charges are: (i) Government development and recurrent budget, (ii) Tax Credit Scheme, and (iii) infrastructural loan from the ADB.

#### **i). Government development and recurrent budget**

Government support continues until the road users begin to fully enjoy the benefits of the improved road condition; these user charges will be increased to maintain the desired level of service. Increases will also be imposed to sustain or improve the condition of the road.

#### **ii). Tax Credit Scheme**

The tax credit scheme is a road construction and maintenance financing arrangement between the Government and the resource development companies, especially mining, oil palm and logging companies. The companies directly take on the responsibility of constructing and maintaining roads at a value equivalent to what they would pay in company tax.

#### **iii). Infrastructural Loan**

The Government has proposed that the ADB help finance a road investment program through a multi-tranche financing facility equivalent of US\$400 million over a 10 year implementation period. The Government will contribute US\$200 million whilst other external financiers will contribute US\$150 million. The National Roads Authority takes responsibility for project managing the maintenance once the road is reconstructed or upgraded, e.g. to a bituminous pavement.

One of the strengths of the PNG Road Fund is its transparency and accountability; the NRA Board includes representatives of road users. More importantly, the Government or the Minister responsible has no individual say on how the road fund can be used. The Minister's daily office operational costs are met by the Departments of Transport and Works.

## **4.0 ROAD PROJECT MANAGEMENT MODELS**

The NRA has adapted international best practice models in project procurement and management. Prior to the introduction of various project delivery models, the DOW was using traditional rates and

contracting schemes. The NRA has introduced performance based contracts and various public/private partnership delivery models as discussed in the next section of this paper.

#### **4.1 Public Agency Partnership**

The Public Agency Partnership is a project implementation and management concept developed by the NRA. It utilises already established facilities and DOW technical staff. The concept was developed to facilitate in situations where another government department has the technical and equipment capacity which the private sector does not have and or in Provinces where there is lack of private contractors.

In accordance with Section 40(3) of the PNG Public Finances Management Act 1995, engagement of public bodies/departments to deliver projects would not require full procurement such as public tendering. Therefore, to facilitate this requirement, the NRA has developed Memorandum of Understanding (MOU) with the Department of Works. The attachments to the MOU are the specifications for the specific and routine maintenance works, including defined service levels.

The DOW is expected to manage and deliver the specified works according to established specifications and required service levels. The non-technical components of the routine maintenance works, such as vegetation control and drainage clearance, are generally sub-contracted to local community groups along the road corridor under a Community Participation arrangement.

Under the PAP arrangement, the NRA has managed to engage DOW to project manage and deliver 270 km of National roads under three different MOU agreements.

#### **4.2 Performance Based Road Contracts**

Prior to the establishment of the National Roads Authority until now, the DOW continues to use traditional contract methods in project procurement and management. Some of the major problems associated with the use of the traditional contract procurement in PNG have been the variations in awarded contracts, no value for money and short asset life. In the light of these experiences, the NRA has adopted performance based contracts developed by the World Bank. [3]

The NRA reviewed the document and tailored it to suit the country's civil works specifications. It also developed service level requirements to suit the available funding.

The NRA developed and conducted four regional domestic roadshows to introduce the concept of performance based contracts to local contractors. The contractors acknowledged that the concept prompted innovative technical approaches and guaranteed long term work for them. The only concern was that the concept was new and that contractors required training workshops and ample time to grasp the knowledge.

The NRA has pre-qualified possible contractors in the four regions of the country and conducted training workshops in performance based road contracts. Short-listed contractors were invited to tender for the selected roads which were part of the National roads network gazetted by legislation by the Minister for Transport, Works and Civil Aviation (the Minister responsible for the transport sector) before being passed over to the NRA to manage.

#### **4.3 Public-Private Partnership (PPP)**

The government of PNG has directed public departments and statutory bodies such as the Department of Transport, Department of Works and the National Roads Authority to utilise private sector expertise and resources through a National Executive Council (NEC) Decision in October 2008. This decision is expected to ease the budgetary pressure on the Government and allow them to concentrate on other essential areas whilst major road infrastructure projects are identified and financed through the PPP. A policy developed through a Technical Assistance from the ADB has been approved by the Government.

The NRA has identified various projects being managed under various PPP models. Examples of projects managed by the NRA under the PPP procurement method are now presented.

##### **4.3.1 Lae Main Wharf to Nadzab Airport Road Reconstruction**

The NRA has awarded a US\$450,000 survey and design contract to a consultant for a 40 km road reconstruction project. The tender was let out to a private contractor under the Build Maintain Transfer (BMT) PPP model. The cost of reconstruction is estimated to be US\$8 million, with 6 years maintenance duration.

A contract for the construction of a weighbridge, at a cost of US\$750,000, was also awarded as part of the BMT contract. The contractor is responsible for the management of the weighbridge, including the collection of revenue from charges and fines.

#### **4.3.2 Highlands Region Road Improvement**

The Highlands region road improvement project, funded under the multi-tranche financing facility, was developed under the BMT PPP model. The contractors responsible for reconstruction or upgrading will maintain and manage the maintenance component of the contract for 10 years. The DOW will manage the improvement of 1,400 km of the Highlands region core road network, funded through four tranches. The DOW will transfer projects improved under the four tranches to the NRA, who will be responsible for awarding and managing the long-term maintenance contracts. The length of the Highlands core road network is 2,500 km, of which 1,100 km is currently in good condition. [6]

### **5.0 CONCLUSIONS**

The PNG Government has realised over the years that roads should not be managed like free social services but rather like a business. This has prompted the establishment of the NRA to adapt international best practice and modern techniques in the reforming, financing and management of roads through the incorporation of a range of engineering, economics, finance, environment and management techniques and the wider participation of the private sector through PPP policies. It is envisaged that, through the adoption of these road management techniques, the local construction industry in PNG will be developed and exposed to modern concepts of road maintenance deliveries.

The introduction of performance based contracts and PPP procurement methods have created a great deal of interest within the construction industry in PNG. The lessons learnt from these pilot projects in project implementation and management arrangements will be replicated to other road infrastructure projects in the country. This approach is also the transport sector's contribution to improving road accessibility to the rural population, thus realising the objectives of the Millennium Development Goals of addressing poverty alleviation which PNG is a signatory to.

#### **5.1 Achieved NRA improvements on road financing and management**

Some of the lessons learnt from introducing of modern techniques in road project management and financing are as follows.

- a) Road infrastructure is managed as a business involving a range of disciplines, including engineering, economics, finance, environment and management.
- b) The Road Fund is primarily dedicated, and readily available, to road financing and management.
- c) There is transparency and accountability in the operating of the Road Fund through the NRA Financial Management System.
- d) The Road Fund is allocated free of political interference.
- e) The PNG Road Asset and Bridge Management systems (RAMS and BAMS) are used in resource optimisation in road management and financing.
- f) Public Agency Partnerships have been developed to utilise resources and skills within the public service.
- g) Performance based contracts and Public Private Partnership models have been developed and adopted.

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